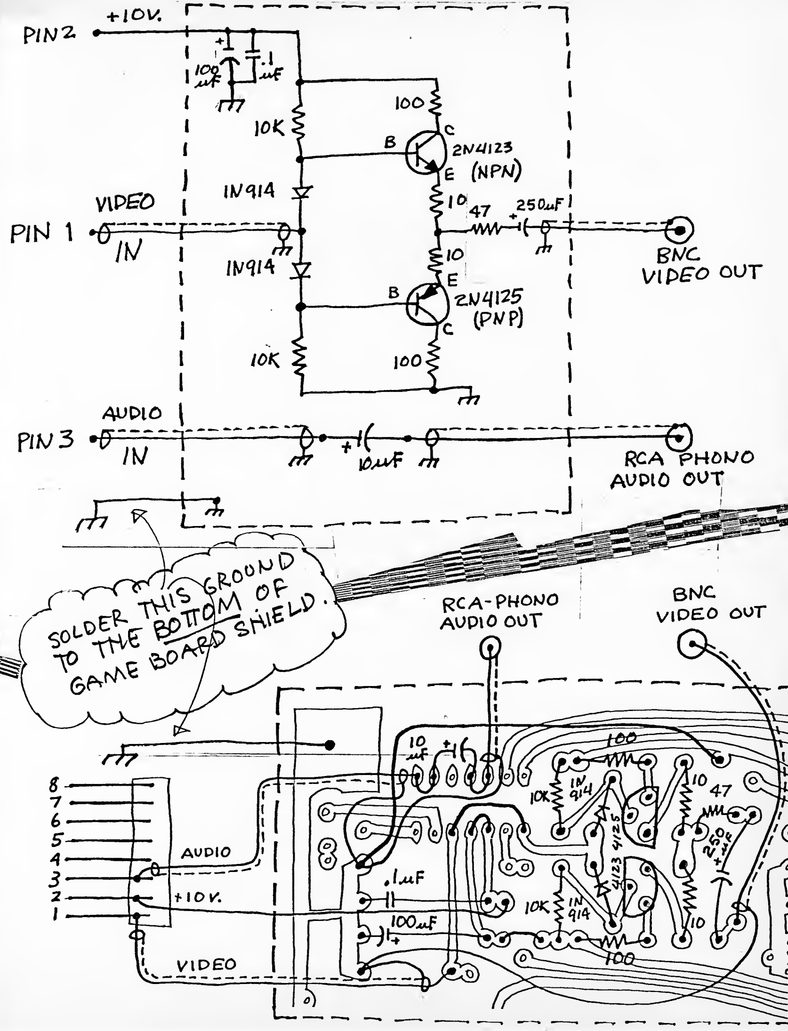
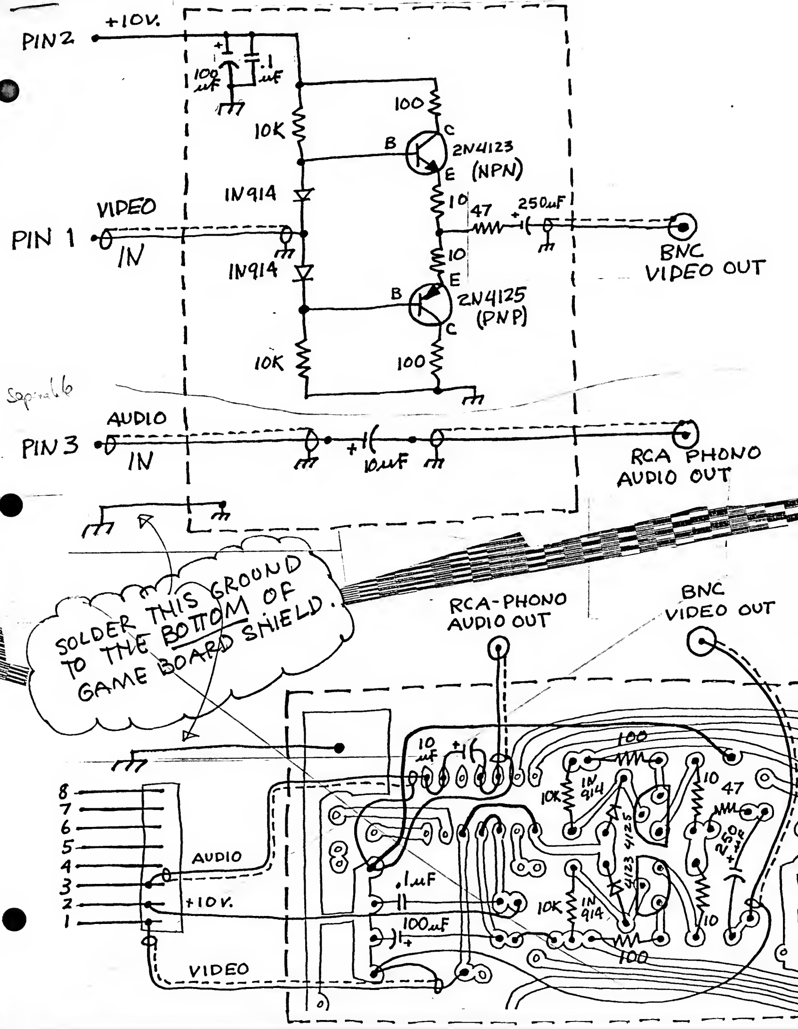


SOLDER THIS GROUND TO THE BOTTOM OF GAME BOARD SHIELD.



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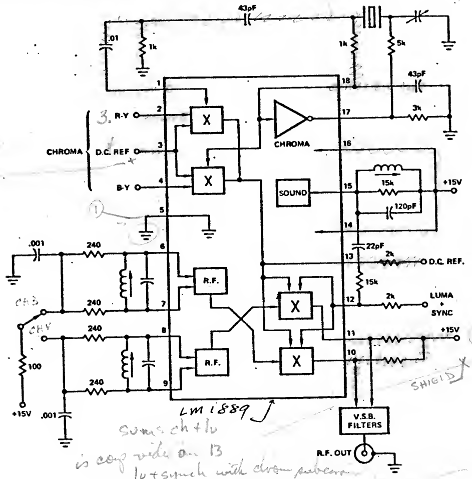
Digital Chip Crystal



sums ch + lv
is comp video on 13
lv + synch with chrom subcarr

Ball

8|-5
B-Y
R-Y
+2.5
4) CHROMA
AUDIO
+10
1) VIDEO

FIGURE 13. 2-Channel Encoder/Modulator

with: yes, use emitter follower

no subcarrier only
∴ video in pin 12

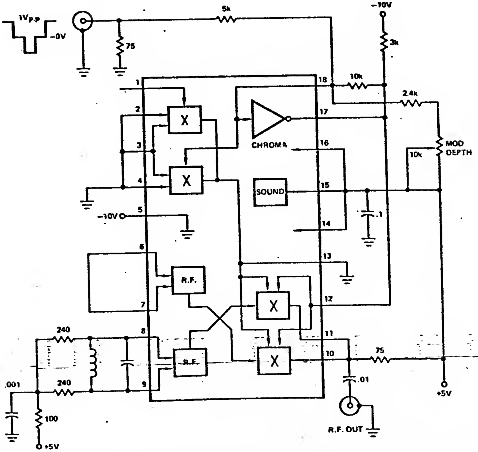


FIGURE 14. D.C. — Coupled N.T.S.C. Modulator

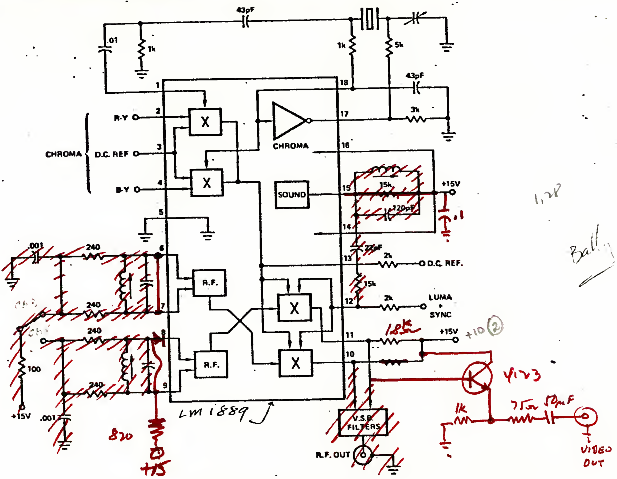


FIGURE 13. 2-Channel Encoder/Modulator

1,2R

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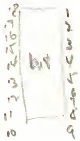


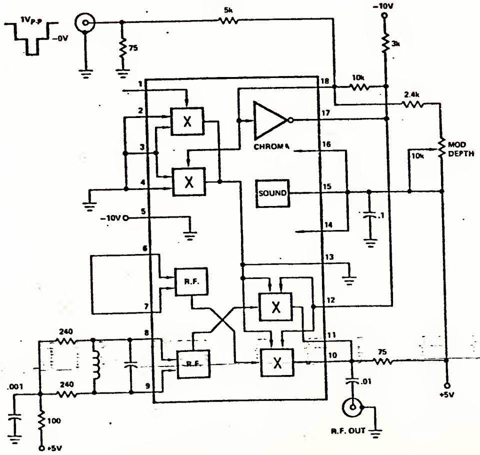


FIGURE 14. D.C. Coupled NTSC Modulator

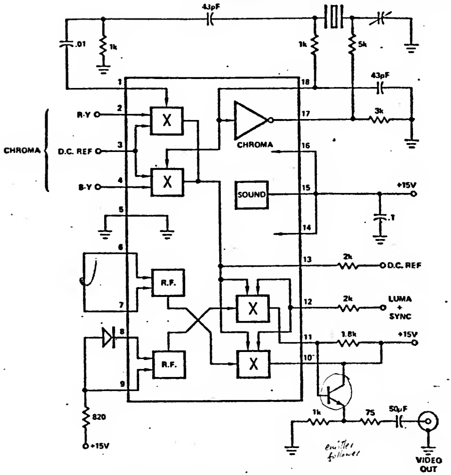


FIGURE 15. Composite Video Encoder

lator d.c. reference is set by grounding pin 13 and the modulation depth is adjusted by varying the offset current at the inverter input.

This system gives true d.c.-coupling, i.e. peak carrier level is independent of picture information. When only one channel is required the other oscillator tank pins are shorted together and left floating as shown.

Composite Video Encoder

In the application shown in Figure 15 the requirement is only to encode a 1Vp-p composite video signal from the color difference and luma + sync components. The chroma encoding section is operated as in Figure 13; however, one R.F. oscillator is permanently offset by connecting a diode across the tank pins. This offsets the corresponding modulator top quad which passes the subcarrier and luma + sync signals summed in the lower pair through to the output pin. An external emitter follower is used to drive a 75 ohm load.

RESULTS

One of the primary concerns in the development of the integrated video modulation system was oscillator stability. The results for the actual I.C. are summarized in Table 2. The permanent need for crystal control of the R.F. oscillators. The chroma oscillator output has less than 30nSec rise and fall times, making it suitable for clocking any associated digital logic.

TABLE 2
OSCILLATOR STABILITY

	vs. TEMP	vs. SUPPLY
Chroma	1Hz/°C	3Hz/V
Sound	–50Hz/°C	500Hz/V
R.F.	–2kHz/°C	10kHz/V

Figure 16 shows the modulator input common mode range as a function of supply voltage. The modulator output levels are a function of the pin 13 and R.F. output load resistors. Table 3 gives A.C. parameters measured in the application circuit of Figure 13.

TABLE 3
A.C. PARAMETERS

Chroma Oscillator Output, Pin 17	5V$_{p\text{-}p}$ square wave
Chroma Modulator Conversion Gain	0.6V$_{p\text{-}p}$/Volt
R.F. Modulator Conversion Gain	10mV$_{rms}$/Volt
Output Beat Products	–60dB
Output Harmonics (un-filtered)	
2nd, 3rd	–12dB

PARTS LIST

Resistors:

1	47Ω 1/4 watt
2	10Ω 1/4 watt
2	100Ω 1/4 watt
2	10kΩ 1/4 watt

Capacitors:

1	.1uF 50wvdc cer. disc.
1	10uF 25wvdc electrolytic
1	100uF 25wvdc electrolytic
1	250uF 12wvdc electrolytic

Transistors:

1	2N4125 (PNP)
1	2N4123 (NPN)

Diodes:

2	1N914

Wire/cable:

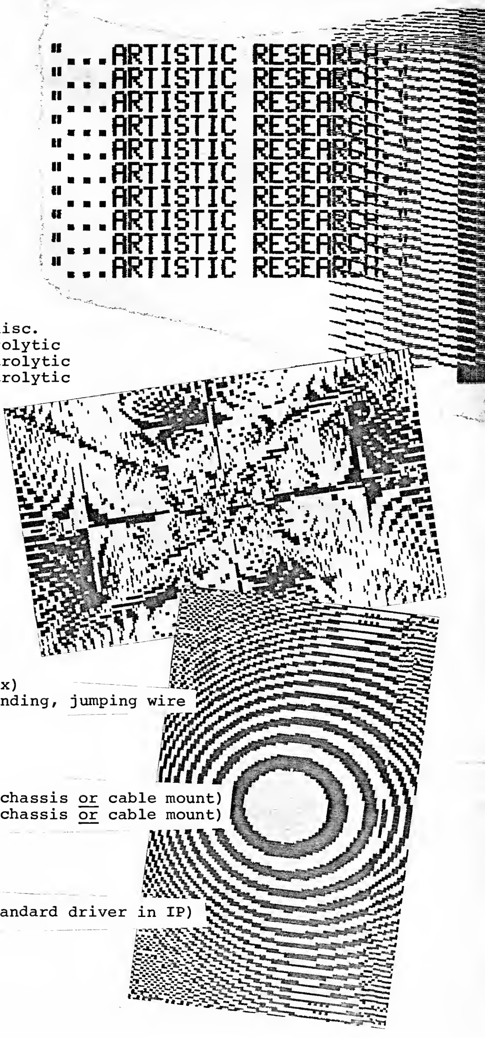
4 feet	RG 174/U (coax)
2 feet	hook-up, grounding, jumping wire

Connectors:

1	RCA phono-female (chassis or cable mount)
1	BNC video-female (chassis or cable mount)

PC Board:

1/4 of a #217 board (standard driver in IP)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